

REMARKS

Claims 1 and 4-16 remain in this application. Claims 2-3 have been canceled and claims 17-33 have been withdrawn. Claim 1 is currently amended. In view of the Examiner's earlier restriction requirement, Applicant retains the right to present claims 17-33 in a divisional application.

In this Response, Applicant amends claim 1 and addresses the Examiner's rejections. The amendments are supported throughout the specification, and no new matter has been added. Amendments to the claims are being made solely to expedite prosecution and do not constitute an acquiescence to any of the Examiner's rejections. Applicant's failure to comment on the Examiner's rejections of the dependent claims constitutes a recognition that such rejections are moot based on Applicant's comments with respect to the corresponding independent claims.

I. Claim Rejections Under 35 U.S.C. § 112 ¶ 2

Claims 1 and 4-16 were rejected under 35 U.S.C. § 112 ¶ 2 as allegedly being indefinite for failing to have a proper antecedent basis. Applicant respectfully submits that in view of the current amendment this rejection is moot.

II. Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1 and 4-16 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent Pub. No. 2002/0096680 to Sugano et al. (hereinafter "Sugano") in view of U.S. Patent Pub. No. 2002/0104750 to Ito (hereinafter "Ito") and U.S. Patent No. 5,591,668 to Maegawa et al. (hereinafter "Maegawa"). Applicant respectfully traverses this rejection and

respectfully submits that in view of the current amendment this rejection is moot. To reject claims in an application under Section 103, an Examiner must establish a *prima facie* case of obviousness. Under the Supreme Court's guidelines enunciated in *Graham v. John Deere*, 383 U.S. 1, 17 (1966), and reaffirmed in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007), to establish a *prima facie* case of obviousness, the Examiner has an obligation to construe the scope of the prior art, identify the differences between the claims and the prior art, and determine the level of skill in the pertinent art at the time of the invention. Applicants respectfully submit that the Examiner has failed to meet this burden to establish a *prima facie* case of obviousness for the rejection under 35 U.S.C. § 103(a), as set forth in detail below.

The only independent claim pending, currently amended claim 1, is directed to “a method for processing a thin film sample, comprising the steps of,” *inter alia*,

(b) masking the at least one beam pulse to produce at least one masked beam pulse, wherein at least one masked beam pulse is used to irradiate at least one portion of the thin film sample;

(c) with the at least one masked beam pulse, irradiating the at least one portion of the film sample with sufficient intensity to completely melt the at least one portion of the thin film sample throughout its thickness and across its entire area; and

...

None of Sugano, Maegawa or Ito disclose or suggest at least the feature of “irradiating the at least one portion of the film sample with sufficient intensity to completely melt the at least one portion of the thin film sample throughout its thickness and across its entire area,” as recited in amended independent claim 1.

The Examiner alleges that Sugano discloses the above-referenced feature, with reference to Figures 21-23 because “[a]t least portions of the film 4B [do] not contain[] nuclei K.” Applicant respectfully submits the Examiner has misconstrued the disclosure of Sugano. The cited portions of Sugano specifically disclose that “the semiconductor thin film 4B is

substantially melted, but the nuclei K remain as they are.” Sugano, ¶ [0091]. As Applicant understands the Examiner’s rejection, he appears to be contending that this element is met because there is some area between nuclei K that *may or may not* be completely melted.

First, it is not clear from Sugano whether or not the areas between nuclei K are completely melted; rather it is only clear that nuclei K are not melted. *See* MPEP § 2112(IV) (“The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.”) (citing *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993)). It is respectfully submitted that the Examiner’s assertion that Sugano discloses the areas between nuclei K are completely melted is not supported by the disclosure of Sugano.

Second, Sugano discloses that the nuclei K are spread out across the area to be irradiated. *See, e.g.*, Sugano, Fig. 21B. Thus, Sugano teaches away from, and does not disclose or suggest that “the at least one portion of the film sample” is irradiated “with sufficient intensity to completely melt the at least one portion of the thin film sample throughout its thickness and across its entire area,” such that the sample crystallizes into a first area and a second area “wherein the first area surrounds the second area, and is configured to allow an active region of an electronic device to be provided at *a distance therefrom*,” as recited in amended independent claim 1. Sugano cannot meet this feature because it does not disclose or suggest the complete melting of “the at least one portion of the film sample . . . across its entire area,” and therefore, Sugano is not “configured to allow an active region of an electronic device to be provided at a distance” from the first area which abuts the less than completely melted areas. Rather, Sugano discloses that the less than completely melted areas are spread throughout the area to be irradiated, leaving no space for an active region to be provided “at a distance” from those areas

that about the less than completely melted areas.

Third, independent claim 1 states that “*the* at least one portion of the film sample” is irradiated “with *the* at least one beam pulse.” Sugano clearly discloses a method of bulk irradiation (*see* ¶ [0057], etc.) and therefore, the entire area 4B depicted in Figures 21B, 22B and 23B is irradiated with a *single* beam pulse which has an energy density below that which is necessary to completely melt “the thin film sample *throughout its thickness and across its entire area.*” In other words, Sugano does not disclose that a single beam pulse completely melts one portion of the sample while another, different beam pulse does not completely melt the sample. In contrast, amended independent claim 1 recites that “*the* at least one beam pulse” has “sufficient intensity to completely melt *the* at least one portion of the thin film sample throughout *its* thickness and across *its* entire area.” For at least this reason, Sugano does not disclose this element of independent claim 1. Neither Ito nor Maegawa remedy the deficiencies of Sugano. Accordingly, Applicant respectfully requests withdrawal of the rejection of amended independent claim 1 under 35 U.S.C. § 103(a).

In addition to the above reasons, Sugano specifically teaches away from the configuration of amended independent claim 1. Sugano discloses that a “film forming step is firstly conducted to form a semiconductor thin film comprising an amorphous material or a polycrystalline material having a relatively small particle diameter on the insulating substrate 0. The irradiation step is then conducted to irradiate the semiconductor thin film with the laser light 50 to convert the amorphous material or the polycrystalline material having a relatively small particle diameter to a polycrystalline material having a relatively large particle diameter.” Sugano, ¶ [0059]. Thus, as a threshold hold matter Sugano is clearly directed to methods for growing larger crystal grains in the areas of irradiation.

Sugano then repeatedly disparages having a semiconductor thin film with relatively small crystal sizes, stating in the Background section that “in conventional direct annealing method of amorphous silicon, the crystalline particle diameter of polycrystalline silicon obtained is 50 nm or less in average, and *thus increase in crystalline particles size is demanded.*” *Id.* at ¶ [0006] (emphasis added). Also, “[t]here is a problem in that when the other part than the ‘boundary part’ is irradiated at optimum energy, the ‘boundary part’ is over-irradiated, in which the semiconductor thin film is *microcrystallized to deteriorate the performance* of the thin film transistor.” *Id.* at ¶ [0008] (emphasis added). Further, Sugano states that “when the energy density exceeds 1, the crystals *disadvantageously becomes fine* due to supply of *excessive heat energy.*” *Id.* at ¶ [0078] (emphasis added). Thus, Sugano presents a clear case of a reference that teaches away from the claimed feature of “irradiating the at least one portion of the film sample with sufficient intensity to completely melt the at least one portion of the thin film sample throughout its thickness and across its entire area,” as recited in amended independent claim 1.

Ito similarly disparages “irradiating the at least one portion of the film sample with sufficient intensity to completely melt the at least one portion of the thin film sample throughout its thickness and across its entire area,” as recited in amended independent claim 1. Particularly, Ito states that when “the whole surface of the region irradiated with the laser beam is micro-crystallized . . . the mobility of the electron is lowered as shown in FIG. 4.” Ito, ¶ [0025]. *See* MPEP § 2145 (“A prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness.”). Thus, Ito is directed to a method for growing large grained crystals through any micro-crystallized area to eliminate the electron mobility issues. *See* Ito, ¶¶ [0026], [0230]-[0231]. For at least the above reasons, a

person of ordinary skill in the art at the time of the invention would not have been motivated or otherwise lead to the configuration of amended independent claim 1. Indeed, as set forth above, it is far more likely a person of ordinary skill in the art would be lead away from the configuration of amended independent claim 1.

Therefore, Applicant respectfully submits that the rejection of amended independent claim 1 under 35 U.S.C. § 103(a) as unpatentable over Sugano in view of Ito and Maegawa should be withdrawn. The rejections of claims 4-16 should also be withdrawn, as claims 4-16 all depend from claim 1, and are therefore patentable over the prior art for at least the same reasons discussed above.

CONCLUSION

Applicant does not believe that any additional fee is required in connection with the submission of this document. However, should any fee be required, or if any overpayment has been made, the Commissioner is hereby authorized to charge any fees, or credit any overpayments made, to Deposit Account 02-4377.

Respectfully submitted,

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Paul A. Ragusa
Patent Office Reg. No. 38,587
Attorney for Applicant
(212) 408-2588

Baker Botts L.L.P.
30 Rockefeller Plaza
New York NY 10112